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Published in:
Journal of Family Psychology

DOI:
[10.1037/a0021009](https://doi.org/10.1037/a0021009)

IMPORTANT NOTE: You are advised to consult the publisher's version (publisher's PDF) if you wish to cite from it. Please check the document version below.

Document Version
Publisher's PDF, also known as Version of record

Publication date:
2010

[Link to publication in University of Groningen/UMCG research database](#)

Citation for published version (APA):

Schokker, M. C., Stuive, I., Bouma, J., Keers, J. C., Links, T. P., Wolffenbuttel, B. H. R., Sanderman, R., & Hagedoorn, M. (2010). Support Behavior and Relationship Satisfaction in Couples Dealing With Diabetes: Main and Moderating Effects. *Journal of Family Psychology*, 24(5), 578-586.
<https://doi.org/10.1037/a0021009>

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Support Behavior and Relationship Satisfaction in Couples Dealing With Diabetes: Main and Moderating Effects

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This study examined associations between support behavior, i.e. active engagement and protective buffering, and relationship satisfaction in both patients with diabetes and their partners. Active engagement refers to supportive behavior characterized by involving one's partner in discussions, asking how the other feels, and problem solving strategies. Protective buffering refers to less supportive behavior characterized by denying fears and worries, and by pretending everything is fine. Furthermore, we examined whether there were interactive effects of these two support behaviors on patients' and partners' relationship satisfaction. At baseline (T1), 205 couples rated to which degree they received active engagement and protective buffering from their partners, and completed a measure of relationship satisfaction. At three follow-up assessments, couples were asked to fill out the same measures. Using dyadic data analytic approaches, we found relationship satisfaction to be positively associated with active engagement, and negatively with protective buffering, in both patients and partners. Moreover, we found a moderating effect, in that the negative association between protective buffering and relationship satisfaction was only present when levels of active engagement were relatively low. Again, these results were found for patients as well as their partners. We were able to replicate the T1 results at the other three assessment points. Our findings illustrate the need to consider adequate and less adequate support behaviors simultaneously, and to study the effects on both patients and partners.

Keywords: relationship-focused coping, spouses, dyadic, chronic illness, marital quality

A chronic illness such as diabetes can have a considerable impact on patients since they are confronted with major life-style changes and the prospect of possible future complications. Furthermore, the disease may also profoundly impact those who are close to the patient, most notably the partner, and their intimate relationship (for overviews see Berg & Upchurch, 2007; Burman & Margolin, 1992). The vulnerability-stress-adaptation model of marriage (Karney & Bradbury, 1995) proposes that stressors encountered by couples may affect adaptive processes such as the behaviors couple members exchange, which in turn may affect rela-

tionship satisfaction. Nowadays, it is increasingly recognized that a chronic illness can be perceived as a stressor shared by patients and partners, urging for the adoption of relationship-focused coping strategies, that is, ways to cope with the illness and each others' emotional responses (for overviews see Berg & Upchurch, 2007; Bodenmann, 1997).

An increasing number of studies have demonstrated the important role the family and the partner may have on diabetes patients' psychosocial outcomes (e.g., Chesla et al., 2003; Fisher et al., 2004; Hagedoorn et al., 2006; Trief et al., 2006; Wearden, Tarrier, & Davies, 2000). There are also a number of studies that have examined psychosocial outcomes in partners of patients with diabetes (e.g., Fisher, Chesla, Skaff, Mullan, & Kanter, 2002; Gonder-Frederick, Cox, Kovatchev, Julian, & Clarke, 1997; Stahl, Berger, Schaechinger, & Cox, 1998; Wearden, Ward, Barrowclough, & Tarrier, 2006) but these studies have not examined whether partners' psychosocial outcomes could be predicted by patients' behaviors towards the partner. Therefore, the aim of the current study is to examine how patients' and partners' support behaviors may help both patients and their partners to maintain their relationship satisfaction in the face of diabetes.

Coyne and Smith (1991) have distinguished two types of relationship-focused coping, which we will refer to as ways of providing support, namely active engagement and protective buffering. Active engagement consists of support

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behaviors, including openly discussing the illness with the other, asking how the other is feeling, and engaging in joint problem solving strategies. Protective buffering refers to support behaviors such as hiding one's concerns for the other, pretending everything is fine and avoiding conflict. Both active engagement and protective buffering refer to support behaviors that are aimed at dealing with a chronic illness, in this case diabetes.

It has been suggested that when couple members communicate openly with each other and express their personal feelings, they perceive each other as responsive and understanding, which in turn enhances couples' intimacy and relationship satisfaction (Laurenceau, Barrett, & Pietromonaco, 1998; Reis & Shaver, 1988). This implies that a support behavior such as active engagement, which includes open communication, will be positively associated with relationship satisfaction. Indeed, previous studies of patients with cancer or heart disease have demonstrated positive associations between partners' active engagement and patients' relationship satisfaction (Buunk, Berkhuysen, Sanderman, & Nieuwland, 1996; Hagedoorn et al., 2000; Hinnen, Hagedoorn, Ranchor, & Sanderman, 2008; Kuijer et al., 2000). Although the use of protective buffering may be well-intended, this strategy is expected to have a negative impact on relationship satisfaction, since it includes withholding feelings and concerns instead of sharing them. Consistent with this notion, some studies have shown that partners' protective buffering was negatively associated with relationship satisfaction of patients with cancer (Hagedoorn et al., 2000; Hinnen et al., 2008; Langer, Rudd, & Syrjala, 2007; Langer, Brown, & Syrjala, 2009), although other studies have not found significant associations (Buunk et al., 1996; Kuijer et al., 2000). This study examines protective buffering displayed by the partner as perceived by the recipient, which may especially be detrimental. That is, when you are aware that your partner is trying to hide his or her worries from you, this may have more negative effects on your relationship satisfaction than when your partner is effectively hiding his or her worries so you do not recognize the buffering of your partner.

Active engagement and protective buffering are support behaviors that can be enacted by both patients and partners; however, most studies have focused on partners' support behaviors and patients' psychological outcomes such as relationship satisfaction. One of the few studies that focused on patients' perception of their own active engagement and protective buffering and partners' relationship satisfaction reported nonsignificant correlations (Coyne & Smith, 1994). Another study, however, did find partners' relationship satisfaction to be negatively associated with both patients' perception of their own buffering as well as partners' perception of received buffering (Langer et al., 2009).

In the present study, we examined associations between support behaviors (i.e., active engagement and protective buffering enacted by the significant other as perceived by the recipient) and relationship satisfaction in both patients and partners, using a dyadic data analytic approach that takes into account the nonindependence between patients and partners (Kenny, Kashy, & Cook, 2006).

Relationship Satisfaction as a Function of the Interactive Effect of Active Engagement and Protective Buffering

Receiving active engagement does not preclude that one also receives protective buffering. For example, it is possible that at a certain moment, a person shows active engagement by asking how the other is feeling, while at another moment, the same person shows protective buffering by avoiding talking about the illness and pretending everything is fine. It is also possible that a person adopts active engagement with regard to some aspects of the illness, and protective buffering with regard to other aspects. This notion is supported by previous studies showing that although receiving higher levels of active engagement was associated with receiving lower levels of protective buffering, correlations were only weak to moderate (e.g., de Ridder, Schreurs, & Kuijer, 2005; Hagedoorn et al., 2000; Hinnen et al., 2008; Schokker, Links, Luttik, & Hagedoorn, 2010). Thus, active engagement and protective buffering can co-occur, and it would be interesting to examine not only the main effects but also the interactive effects of these support behaviors on relationship satisfaction.

The current study addresses this unexplored question. We argue that receiving inadequate support such as protective buffering may be less harmful, if at the same time, individuals receive high levels of active engagement. Active engagement, which is considered to be a more adequate support behavior, may counteract the negative effect of buffering. Particularly in the absence of active engagement, protective buffering may be more strongly associated with relatively low levels of relationship satisfaction.

The underlying rationale is that different attributions about stability (e.g., my partner hardly ever acts like this vs. my partner always acts like this) and intentions (e.g., my partner tries to protect me from further burden or my partner is indifferent to what happens to me) may be made for protective buffering, depending on the levels of received active engagement. These different attributions in turn can be expected to be differently associated with relationship satisfaction (for overviews see Bradbury & Fincham, 1990; Bradbury, Fincham, & Beach, 2000). For example, it has been found that perceiving negative partner behavior as stable and intentional was negatively associated with relationship satisfaction (Fincham & Bradbury, 1992).

Less adequate support behavior such as protective buffering may be perceived as less negatively intended when at the same time, one receives high levels of active engagement. The other person's buffering can be perceived as an attempt not to add more distress. Therefore, received buffering may not be associated with less relationship satisfaction, since it is not viewed as negative behavior under these circumstances. In contrast, received buffering may be perceived as negatively intended when at the same time, one receives low levels of active engagement. In this situation, one may believe that the other person pretends everything is fine because he or she does not care at all. Received buffering is then viewed as negative behavior and is likely to have negative effects on relationship satisfaction.

The hypothesis that detrimental effects of inadequate support on psychological outcomes may be buffered by adequate support from friends, family or the partner has been previously investigated and supported, but mainly in patients (Kleiboer et al., 2007; Manne et al., 2003; Revenson, Schiaffino, Majerovitz, & Gibofsky, 1991; Sherman, 2003) and not in partners (with the exception of Kleiboer et al., 2007). It was found that negative support from friends and family was positively associated with distress in patients with rheumatoid arthritis, but only in those patients who also reported receiving little positive support from friends and family (Revenson et al., 1991). Distress levels were highest in patients who reported both high levels of negative support and low levels of positive support. Only few studies focused specifically on partner support, showing inconsistent results. A study of cancer patients did not find support for an interactive effect of positive and negative partner support on distress (Manne, Taylor, Dougherty, & Kemeny, 1997). A study of patients with multiple sclerosis and their partners did find the expected interactive effects, in that the positive association between received negative behavior and negative mood was attenuated when levels of received positive behavior were high (Kleiboer et al., 2007). Moreover, these latter results applied to both patients and their partners.

In our study we will focus on both patients and partners when examining the joint effects of positive and negative support. More specifically, we will examine the interactive effect of received active engagement and protective buffering and we are interested in relationship satisfaction as the outcome measure.

The hypotheses can be summarized as follows:

Hypothesis 1: Received active engagement will be positively associated with relationship satisfaction in both patients and partners;

Hypothesis 2: Received protective buffering will be negatively associated with relationship satisfaction in both patients and partners; and

Hypothesis 3: Received protective buffering will be negatively associated with relationship satisfaction in both patients and partners, especially if levels of received active engagement are relatively low.

Method

Participants and Procedure

Patients with type 1 and 2 diabetes requiring insulin from two outpatient clinics were invited to participate in a longitudinal study, as well as their partners (for a more detailed description of the procedure see Schokker et al., 2010). The aim of this study was to investigate adaptation to diabetes in both patients and partners. Overall, 223 of the 413 couples that were sent the baseline (T1) questionnaire completed it. Two of these couples were excluded afterwards because they had indicated receiving help filling out the questionnaire, and 16 were excluded because patients in these cou-

ples were referred to a diabetes education program. This means the final sample at T1 consisted of 205 couples. After couples had filled out the T1 questionnaire they were sent three more questionnaires (T2 – T4); approximately three to four months separated the administration of the first three questionnaires ($M = 0.32$ years, $SD = 0.10$ for T1 – T2; $M = 0.31$ years, $SD = 0.02$ for T2 – T3), and five to six months separated the third and fourth questionnaire ($M = 0.40$ years, $SD = 0.03$). The T2 questionnaire was filled out by 154 couples, and the T3 and T4 questionnaire was filled out by respectively 142 and 129 couples.

Measures

Support behaviors. We used a questionnaire developed by Buunk et al. (1996) to assess two ways to support the ill or healthy partner, namely active engagement and protective buffering. Both patients and partners were asked to rate to what extent the other adopted each specific strategy in reaction to the illness. All items were measured on a 5-point scale ranging from 1 (*never*) to 5 (*very often*). Previous studies have reported adequate internal consistencies and test-retest reliabilities have been found for the subscales (Buunk et al., 1996; Hagedoorn et al., 2000; Hinnen, Hagedoorn, Sanderman, & Ranchor, 2007; Kuijer et al., 2000). Five items were averaged into the active engagement scale. Examples are “My partner asks me how I feel” and “When something bothers me, my partner tries to discuss the problem” (Cronbach’s $\alpha = 0.87$ and 0.85 , for patients and partners respectively). Six items were averaged into the protective buffering scale. Examples are “My partner tries to hide his or her worries about me” and “My partner tries to act as if nothing is the matter” (Cronbach’s $\alpha = 0.70$ and 0.80 for patients and partners respectively).

Relationship satisfaction. We used the Dutch version of the marital quality subscale of the Maudsley Marital Questionnaire (MMQ) to assess relationship satisfaction in patients and their partners (Arrindell, Boelens, & Lambert, 1983). The subscale consists of 10 items measured on a 9-point scale. The items were averaged into one index, with higher scores indicating higher relationship satisfaction. Item examples are “Are you satisfied about the leisure time you spend with your partner” and “How often do you think about getting a divorce?” (Cronbach’s $\alpha = 0.91$ for both the patient and partner version).

Statistical Testing of the Hypotheses using Dyadic Data Analytic Approaches

Scores of patients and their partners cannot be regarded as independent from each other (Kenny et al., 2006). First, individuals within a couple are more likely to be similar on a wide range of variables (such as age and socioeconomic status) than randomly paired couples owing to processes of assortative mating. Second, individuals within a couple are nonindependent because characteristics of one individual may affect characteristics of the other. Standard statistical methods such as analysis of variance and multiple regressions are less suitable for analyzing nonindependent data,

because these methods are based on the independence assumption. A drawback of ignoring nonindependence is that it may result in bias in significance testing (Kenny et al., 2006). We have used data analytic approaches detailed by Kenny et al. (2006) that take into account the nonindependence between two individuals, the so-called dyads.

We used MLwiN software (Rasbash, Charlton, Browne, & Healy, 2009) to perform the analyses. With this software, we can adequately analyze our data, which consists of two levels, namely dyads at level 2, and individuals (i.e., patients and partners) nested within a dyad at level 1. All variables were measured at level 1 (predictor and outcome measures). Level 2 (dyads) was specified to take into account the dependence between patient and partner. Following the model presented by Laurenceau and Bolger (2005), patient and partner effects were estimated in the same model. Dummy variables were used to nest patient and partner data within each couple.

All data were grand-mean centered prior to applying the files to MLwiN and two dummy coded variables were created, one for patients (1 = patient, 0 = partner) and one for partners (1 = partner, 0 = patient) (Laurenceau & Bolger, 2005). Following the two-intercept approach suggested by Kenny et al. (2006), each level 1 predictor variable was multiplied by the dummy coded variables to create two separate predictor variables; one for patients and one for partners. At level 1, the general intercept was removed and replaced with the dummy coded variables 'patients' and 'partners' (Kenny et al., 2006).

The model can be specified in the following function: $Y_{ij} = \beta_{0j}(\text{Patient}) + \beta_{0j}(\text{Partner}) + \beta_2(\text{Patient Active Engagement})_j + \beta_2(\text{Partner Active Engagement})_j + \beta_3(\text{Patient Protective Buffering})_j + \beta_3(\text{Partner Protective Buffering})_j + \beta_4(\text{Patient Active Engagement} \times \text{Protective Buffering})_j + \beta_4(\text{Partner Active Engagement} \times \text{Protective Buffering})_j + e_{ij}$, where Y_{ij} is the relationship satisfaction of a member of couple j . The dummy variables were used to estimate the within-person effects for patients and partners in the same model taking into account the nonindependence of patient and partner data.

The constructs of interest in this study were assessed four times over a period of time in both patients and partners. Patients in our study had been diagnosed with diabetes a long time ago, and patients and partners were in long-term relationships. Thus, it is plausible that patients and partners had developed rather stable routines of dealing with the disease and each other. As a consequence, the constructs in our study were not expected to change over time. To test this assumption a data file was created in which the four time points were nested within persons. Multilevel analyses were then performed, separately for patients and partners, where Time (assessment points 1, 2, 3, and 4) was used as a predictor for active engagement, protective buffering, or relationship satisfaction. A nonsignificant slope for this fixed effect of Time indicates that on average there is no change over time on the three variables studied, but this does not exclude the presence of variation in individual slopes. Therefore, not only the fixed effect of Time but also the variation of its slope was tested. If both tests show no

significant effects, longitudinal analyses are not appropriate as there is no variance to explain on the Time level. However, our longitudinal dataset is suitable for testing the robustness of the hypotheses, by analyzing the assessment points separately. Although these findings cannot be considered independent replications, these repeated analyses will show whether or not the findings are sensitive to (selective) drop-out.

Results

Descriptives

At T1, 112 were couples with a male patient and 93 were couples with a female patient. Most couples were married (89.8%). Being married was not required because in the Netherlands, many couples form long-lasting relationships without being married. The mean length of the relationship was 28.7 years ($SD = 12.9$). Patients and partners had a mean age of 54.0 ($SD = 11.2$) and 54.1 years ($SD = 11.7$), respectively. Of the patients, 61.8% had received lower education, 23.1% had received intermediate education, and 15.1% had received higher education. For the partners, this was respectively 57.1%, 25.8%, and 17.2%. On a list of chronic conditions (Ormel et al., 1998), the majority of the patients reported at least one co-morbidity (73.7%) and the majority of the partners (62.9%) also indicated a chronic condition. In both patients and partners, high blood pressure was the most frequently mentioned health condition (31.2% patients, 19% partners). Arthritis was also frequently mentioned (18.0% patients, 17.1% partners). Mean diabetes duration was 15.7 years ($SD = 11.8$) and mean HbA1c level around T1 was 7.2% ($SD = 0.99$; normal values 4–6%, target value <7%), which can be viewed as acceptable. We checked whether the scores on these descriptives differed between couples who completed all four assessments and those who dropped out. It appeared that significantly higher HbA1c levels were observed in patients from couples who had dropped out than in patients from couples who did not drop out: $M = 7.5\%$, $SD = 0.94$ vs. $M = 7.1\%$, $SD = 0.99$, $t(200) = -2.77$, $p < .01$.

We checked whether there were differences between patients' and partners' perceptions of received active engagement and protective buffering, and of relationship satisfaction. Patients reported higher levels of received active engagement than did partners: $M = 3.79$, $SD = 0.74$ vs. $M = 3.51$, $SD = 0.78$, $t(200) = 4.62$, $p < .001$. Patients reported lower levels of received protective buffering than did partners: $M = 2.20$, $SD = 0.65$ vs. $M = 2.41$, $SD = 0.75$, $t(200) = -3.69$, $p < .001$. Patients' and partners' perception of relationship satisfaction did not differ: $M = 6.81$, $SD = 1.08$ vs. $M = 6.70$, $SD = 1.14$, $t(200) = 1.36$, $p = .17$. We compared our scores to those of a reference group of Dutch adults (Schroevers, Ranchor, & Sanderman, 2006). This study reported sum scores and coded relationship satisfaction in a way that higher scores indicate lower relationship satisfaction (first assessment: $M = 13.17$, $SD = 12.37$). After recoding relationship satisfaction in our sample (patients: $M = 11.90$, $SD = 10.84$, partners: $M = 12.97$,

$SD = 11.04$) to match those of the reference group, it appeared that our scores were comparable [patients: $t(301) = 0.92, p > .15$ partners: $t(302) = 0.15, p > .25$].

Table 1 presents the T1 correlations for the variables under study (a comparable pattern of associations was found at the other assessment points). As can be seen, relationship satisfaction of both patients and partners was positively associated with received active engagement, and negatively associated with received protective buffering. To examine whether patient and partner scores were indeed nonindependent we calculated the correlation between T1 patient and partner relationship satisfaction, which was $.50, p < .001$ (see Table 1). However, if there are more variables that can be used to distinguish couple members, it is advised to control for these other distinguishing variables (Kenny et al., 2006). Besides patient and partner status, couple members in our study can be distinguished by gender. The correlations between the patient and partner variables remained significant, after controlling for gender ($.55, .38$, and $.31$, for relationship satisfaction, active engagement, and protective buffering respectively, all p 's $< .001$). This nonindependence indicates the necessity of using the dyadic data analysis approach.

Preliminary Analyses

To test the assumption that the variables in our study are stable over time, the slopes and variances for the predictor Time were studied for the variables active engagement, protective buffering and relationship satisfaction. In all the analyses, the regression weights and variances for Time were nonsignificant for both patients and partners [relationship satisfaction analysis: $B = -0.03, p = .48, \text{Var}(B) = 0.02, p = .75$ for patients, and $B = -0.06, p = .13, \text{Var}(B) = 0.04, p = .64$ for partners; active engagement analysis: $B = -0.02, p = .49, \text{Var}(B) = 0.01, p = .72$ for patients, and $B = -0.01, p = .73, \text{Var}(B) = 0.01, p = .76$ for partners; protective buffering analysis: $B = -0.02, p = .53, \text{Var}(B) < 0.01, p = .94$ for patients, and $B = -0.04, p = .15, \text{Var}(B) = 0.03, p = .30$ for partners]. Thus, the assumption that the variables under study are stable appears

to be supported. This precludes the necessity to perform longitudinal analyses. Instead, we performed separate analyses for all four assessments to test whether the model estimates are similar after drop-out.

Testing the Hypotheses

Table 2 shows that the results are more or less the same at each assessment. As can be seen, received active engagement was positively associated with relationship satisfaction, in both patients and partners. Received protective buffering was negatively associated with relationship satisfaction, in both patients and partners. Our first two hypotheses were thus supported. Table 2 further shows that the interactive effects of received active engagement and protective buffering were significant for both patients and partners. We calculated and plotted the regression slopes for patients and partners at two levels of received active engagement: high ($+1 SD$) and low ($-1 SD$). The interaction figures indicated the same pattern at each assessment point, therefore, we only present the figures for T1. Figure 1 depicts the results for patients. Received protective buffering was negatively associated with relationship satisfaction, but only in patients who reported relatively low levels of received active engagement ($B = -0.43, p = .001$). The association was not significant in patients who reported relatively high levels of received active engagement ($B = -0.01, p = .97$). Similar findings were observed for partners (see Figure 2). The association between received protective buffering and relationship satisfaction was significant in partners who reported low levels of received active engagement ($B = -0.56, p < .001$), but not in partners who reported receiving relatively high levels of active engagement ($B = 0.04, p = .73$). These significant interactive effects are in line with our third hypothesis. We checked whether the interactive effects were qualified by gender, since this was a second distinguishing variable in our study, besides patient and partner status. These results were not significant.

Table 1
T1 Correlations for the Variables Under Study

Variable	2	3	4	5	6	7	8	9	10	11
1. Relationship duration	.17*	.03	.19*	-.11	-.09	.22**	.02	-.15*	.26**	.02
2. Diabetes duration		.17*	-.02	.10	.06	.09	.09	.10	-.05	.11
3. Co-morbidities patient			.31**	-.07	-.02	.21**	-.10	.02	.13	-.03
4. Co-morbidities partner				-.12	.00	.05	-.06	-.09	.15*	-.24**
5. HbA1c					.01	.02	-.02	-.10	-.07	-.12
6. AE patient						-.41**	.63**	.36**	-.21**	.32**
7. PB patient							-.35**	-.21**	.29**	-.15*
8. MMQ patient								.31**	-.20**	.50**
9. AE partner									-.29**	.60**
10. PB partner										-.41**
11. MMQ partner										

Note. N varies as a result of missing values. AE = active engagement as perceived by the recipient; PB = protective buffering as perceived by the recipient; MMQ = relationship satisfaction.

* $p < .05$. ** $p < .01$.

Table 2
Hierarchical Linear Model: Associations Between Support Behavior and Relationship Satisfaction

Analysis	Effect	Patient relationship satisfaction					Partner relationship satisfaction				
		<i>B</i>	<i>SE</i>	<i>d</i>	<i>t</i>	<i>p</i>	<i>B</i>	<i>SE</i>	<i>d</i>	<i>t</i>	<i>p</i>
T1	AE	0.82	0.08	1.37	9.80	<.001	0.75	0.08	1.39	9.92	<.001
	PB	-0.22	0.10	0.32	2.31	.02	-0.26	0.08	0.44	3.12	<.01
	AE × PB	0.29	0.11	0.37	2.65	<.01	0.38	0.08	0.70	5.04	<.001
T2	AE	0.75	0.10	1.23	7.64	<.001	0.81	0.11	1.22	7.58	<.001
	PB	-0.54	0.11	0.77	4.79	<.001	-0.27	0.11	0.38	2.36	.02
	AE × PB	0.44	0.12	0.59	3.67	<.001	0.40	0.14	0.46	2.87	<.01
T3	AE	0.75	0.11	1.19	7.08	<.001	0.88	0.11	1.30	7.73	<.001
	PB	-0.26	0.11	0.41	2.46	.01	-0.30	0.11	0.45	2.65	<.01
	AE × PB	0.34	0.13	0.43	2.65	.01	0.54	0.15	0.62	3.72	<.001
T4	AE	0.90	0.11	1.45	8.24	<.01	0.85	0.14	1.09	6.17	<.001
	PB	-0.41	0.12	0.61	3.46	<.001	-0.43	0.14	0.57	3.21	.001
	AE × PB	0.37	0.14	0.45	2.58	<.01	0.63	0.18	0.62	3.55	<.001

Note. AE = active engagement as perceived by the recipient; PB = protective buffering as perceived by the recipient. Effect size *d* for each *t* was computed with the following equation: $d = 2t/N$, in which *N* is the number of dyad. We examined correlations between demographic variables and the dependent variables to see whether we needed to include covariates. These correlations differed somewhat across the different assessments (T1–T4), however, if these variables (gender, co-morbidities, HbA1c) were included in the analyses, the interactive effects remained significant.

Discussion

To the best of our knowledge, this is the first study that examined associations between support behaviors and relationship satisfaction within couples dealing with diabetes. As expected, relationship satisfaction was positively associated with received active engagement and negatively with received protective buffering, in both patients and partners. The fact that significant associations were found for partners as well, is in line with the reasoning that a chronic illness such as diabetes has an impact on both the patient and the partner and that they both may benefit from or be harmed by certain support behaviors.

Furthermore, our third hypothesis that active engagement would moderate the negative association between protective buffering and relationship satisfaction was supported. We observed this association, but only when levels of received active engagement were relatively low. This interactive effect was found in both patients and partners. The results are consistent with previous studies indicating that positive support may suppress the detrimental effects of receiving negative support (e.g., Kleiboer et al., 2007; Manne et al.,

2003; Revenson et al., 1991). As far as we know, our study is the first to test the interactive effect of positive and negative support in both persons with diabetes and their partners. Our study specifically focused on couples dealing with a chronic illness and our measures of support behavior were embedded in the context of a chronic illness. The findings revealed that the hypothesized support processes are relevant in the context of diabetes. This does not mean however that such processes play a role exclusively in couples who are dealing with illness. In fact our rationale was based on theory of marital attributions examined in marital interaction research (Bradbury & Fincham, 1990). Furthermore, our results are consistent with a study among newly wed couples showing that an individual experienced lower levels of relationship satisfaction when the individual's spouse displayed both high levels of negative communication skills, and low levels of positive affect during a session in which couples discussed marital difficulties (Johnson et al., 2005). Thus, the processes described in our study may be found not only in couples dealing with a chronic illness, but also in couples confronted with other daily stressors and in couples in long-term relationships.

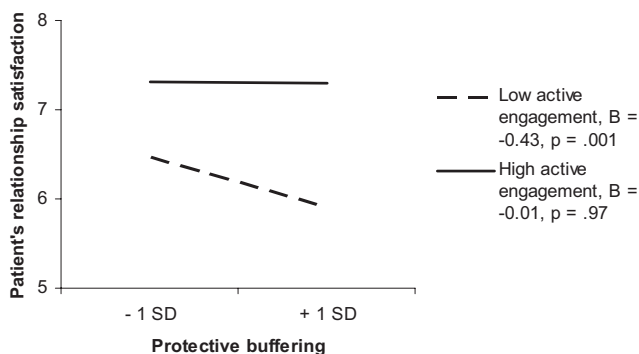


Figure 1. The interactive effect of received protective and active engagement on patient's relationship satisfaction.

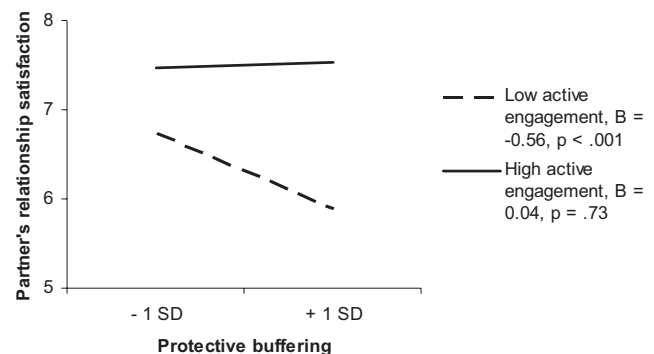


Figure 2. The interactive effect of received protective buffering and active engagement on partner's relationship satisfaction.

As previously mentioned, a possible explanation for the interactive effects is that more benign attributions are made for protective buffering when at the same time, levels of active engagement are high instead of low. These more benign attributions in turn may mitigate the negative impact on relationship satisfaction (for overviews see Bradbury & Fincham, 1990; Bradbury et al., 2000). Related to this, it is likely that protective buffering is more easily forgiven when levels of active engagement are high as people are then more inclined to make more benign attributions to this behavior. This line of reasoning is supported by studies that found that positive attributions were associated with forgiving one's partner for certain behaviors (Fincham, Paleari, & Regalia, 2002). The ability to forgive one's partner in turn, has been shown to be positively associated with relationship satisfaction (Paleari, Regalia, & Fincham, 2005; for an overview see Fincham, Hall, & Beach, 2006). Finally, our findings and argumentation are supported by a study of couples dealing with colorectal cancer (Hagedoorn et al., submitted) that showed that inadequate support (i.e., low levels of active engagement and high levels of protective buffering) was associated with less relationship satisfaction especially when the significant other had not been very supportive in the past. Future research could employ observational studies in which naturally-occurring behavior of couples during a discussion about the illness is coded as supportive or unsupportive. Afterwards individuals could be asked to interpret each other's behavior. Such research may provide an answer to the question whether one indeed interprets the protective buffering (e.g., changing the topic, minimizing a concern) as less negatively intended when levels of active engagement are high.

The focus on both patients and partners is a clear strength of our study. Moreover, we used a dyadic approach in analyzing the results, thereby taking into account the non-independence between patients and partners. Another strength is our rather large sample size. Finally, we had a longitudinal data set. This dataset was not suitable for predicting change over time, as indicated by the non-significant effects of time on relationship satisfaction and active engagement and protective buffering. This was not very surprising, as the majority of the patients in our study had been diagnosed with diabetes many years ago, and because patients and their partners often reported a long relationship duration. As a consequence, we cannot draw any conclusions about causality. Nonetheless, our longitudinal dataset did allow us to see whether the model estimates were similar after drop out. Results showed that the findings were robust despite the fact that patients with worse glycemic control were more inclined to drop out. Future longitudinal studies focusing on couples in which the patient has been recently diagnosed with diabetes are more likely to have predictive value. These couples still need to adjust to the illness and may not yet have established routines in their coping behaviors. So in this context a longitudinal study may shed more light on causality. In our study, it was assumed that active engagement leads to more relationship satisfaction, whereas protective buffering leads to a decreased relationship satisfaction. However, it is also

conceivable that low levels of relationship satisfaction urge one to adopt low levels of active engagement and high levels of protective buffering.

A limitation that should be considered when interpreting the results concerns the response rate. Only couples of whom both the patient and the partner were willing to participate were included. It is possible that our sample was biased towards high-functioning couples. Another limitation is that we used patients' and partners' self-reports of received support and relationship satisfaction, which may lead to common method variance. This has also been referred to as the "glop" problem which entails that correlations are higher when variables are measured with self-report data from a single reporter (e.g., Gottman, 1998).

Our findings may have clinical implications, for example, for the way interventions for couples dealing with a chronic illness should be constructed. Instead of teaching patients and partners to adopt high levels of active engagement and low levels of protective buffering, interventions may be most efficient and effective when they particularly focus on teaching positive strategies. After all, our results may imply that protective buffering is less influential when levels of active engagement are relatively high. Previous intervention studies for couples dealing with cancer have shown that relationship satisfaction may improve in both patients and their partners (Baucom et al., 2009; Kuijer, Buunk, De Jong, Ybema, & Sanderman, 2004). The intervention programs in these studies focused on the types of supportive behaviors patients and partners need from each other. Although more research is needed, our results indicate that it is necessary to examine positive and negative support simultaneously if one wants to obtain a full understanding of support and dyadic coping processes.

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Received December 14, 2009

Revision received June 8, 2010

Accepted August 9, 2010 ■